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MODBUS GUIDELINES

The guidelines listed below must be considered and adhered to when planning and implementing a Modbus Network utilizing the AERCO Boiler Management System (BMS) Model 168, Boiler Management System II (BMS II) Model 5R5-384, and/or C-More Boiler Controllers:

NOTE

Refer to the Modbus Communication Manual GF-114 for more detailed information and descriptions on Modbus Networks and wiring.

- **AERCO BMS, BMS II, AND C-MORE BOILER CONTROLLERS WITH MODBUS CAPABILITIES**

  To ensure that your equipment includes Modbus capabilities, verify that the software versions conform to the following:

  - **BMS:** EPROM Rev. K or higher support Modbus
  - **C-More Boiler Controller:** Software Version 2.00 or higher support Modbus
  - **BMS II:** (ALL BMS II control panels are Modbus capable)

- **WHEN TO USE RS485 & RS232 WIRING INTERFACES**

  The physical hardware wiring interfaces between an AERCO BMS, BMS II, C-More Boiler Controllers and a third-Party Energy Management System (EMS), if used, must conform to the following:

  NOTE

  All Modbus Networks are implemented using a “Master-Slave” technique where only the Master device can initiate a communication sequence. The Slave devices on the Network can only respond when addressed by the Master.

  - **BMS (or BMS II) Master To C-More Boiler Controller Slaves**
    Modbus communication is via a RS485 hardware link. Wiring connections are made between the BMS (or BMS II) internal RS485 connector and the RS485 terminals in the I/O Box associated with each C-More Controller.
  - **EMS Master To C-More Boiler Controller Slaves**
    Modbus communication is via a RS485 hardware link between the EMS and the RS485 terminals in the I/O Box associated with each C-More Controller. If the EMS contains only a RS232 port, a RS232-To-RS485 Converter is required.
  - **EMS Master To BMS (or BMS II) Slave**
    Modbus communication between an EMS and BMS (or BMS II) is via a RS232 hardware link. If the EMS does not have an RS232 port, a RS485-to-RS232 Converter is required. An optional BMS (or BMS II) equipped with a built-in converter is available if needed.

- **WHEN TO USE PULSE WIDTH MODULATION (PWM) WIRING INTERFACES**

  NOTE: Only BMS Model 168 utilizes PWM — the BMS II Model 5R5-384 does NOT.

  The PWM wiring terminals on the AERCO BMS must be used under the following conditions:

  - When wiring the BMS to Boilers that do not have Modbus capability.
  - When using a BMS which does not have Modbus capability (EPROM Rev. J or lower).
  - When wiring CCP Boilers (See the following bulleted item)

- **BOILER PLANTS WITH COMBINATION BOILERS (CCP SYSTEMS)**

  NOTE: Use only BMS Model 168 for CCP Systems — DO NOT BMS II Model 5R5-384.

  An AERCO Combination Control Panel (CCP) is required when wiring one or more Combination (Combo) Boilers. Combo Boilers are used to provide both space heating and domestic hot water loads. Since Modbus capability is not yet available for CCP applications, all Combo Boilers must be wired to the BMS PWM terminals. All other Non-Combo Boilers dedicated to space heating can be wired to the RS485 connections in the BMS and C-More Boiler Controllers.

- **MIXING BOILERS WITH & WITHOUT MODBUS CAPABILITY**

  NOTE: BMS II Model 5R5-384 cannot be mixed with boilers which do not include Modbus.

  When used with a Modbus-capable AERCO BMS, Boilers with Modbus capability can be mixed with earlier units which do not include Modbus. In this situation, units without Modbus must be wired to the Pulse Width Modulation (PWM) terminals in the BMS and Boiler Controller I/O Box. C-More Boiler Controllers with Modbus are wired to the RS485 connections in the BMS and C-More Controller I/O Box.

  It should be noted that AERCO Boilers equipped with older style Modular Control Systems can also be used, when wired to the BMS PWM terminals.